TWENTY LESSONS
ON
BRITISH MOSSES

SECOND SERIES,

3/6.

Emily Priscilla Walker
daughter of Rev John Walker M.A. Cantab
Vicar of Kirkshelpenghe
Northumberland
by
William Thomas Walker
by
William Dalziel Walker
Mother Primrose Lyle née Walker
by
Patricia Anne Lyle

1849 Emily Lincoln Walker

Emily C. Walker

1851

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ILLUSTRATED WITH TWENTY-FIVE SPECIMENS.

BY

WILLIAM GARDINER, A.L.S., A.B.S.E., &c.,

AUTHOR OF

"TWENTY LESSONS ON BRITISH MOSSES," "FLORA OF FORFARSHIRE,"

"BOTANICAL RAMBLES IN BRAEMAR," &c.

"The lowliest thing
Some lesson of worth to the mind can bring."

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TO

SIR WILLIAM JACKSON HOOKER, K.H., LL.D., F.R.A., AND L.S.,

DIRECTOR OF THE ROYAL BOTANIC GARDENS OF KEW,

VICE-PRESIDENT OF THE LINNÆAN SOCIETY,

&c., &c., &c.,

THIS HUMBLE VOLUME

IS RESPECTFULLY

DEDICATED,

WITH HIS KIND PERMISSION,

AS A SMALL TRIBUTE OF ESTEEM AND GRATITUDE,

BY

THE AUTHOR.

PREFACE.

It is a cheering sign of the times, that the taste for Botany, as well as the other branches of Natural History, is rapidly gaining ground. This is clearly evinced by the increasing number of books on these subjects daily issuing from the press; for, as a love for the study of Nature spreads, so will the demand for such useful auxiliaries be enlarged.

Three editions of the First Series of "Twenty Lessons on British Mosses" having been sold in a comparatively short space of time, is proof that this department of the subject is steadily progressing. Though the effort was humble, it is pleasant to reflect upon the result; for doubtless many of my young readers have been thus led to spend some portion of their leisure hours in a study well calculated to afford them not only a healthy and innocent recreation, but greatly to refine and elevate their minds. The more we examine Nature's works, the greater is our delight in them, and the higher do they raise our conceptions of the wise and good Creator. It is therefore a matter of importance to endeavour to diffuse a taste for such pursuits among the rising generation; and should the present little volume be as successful in that respect as its predecessor, the Author's wish will be fully gratified.

158 Overgate, Dundee,
June 7th, 1849.

TWENTY LESSONS

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INTRODUCTION.

My Dear Young Readers,

Pursuant to my promise, I have now much pleasure in renewing our acquaintance, and soliciting your attention to a second course of lessons on our native Mosses. The subject is not soon exhausted; for the objects treated of, though small, are numerous, and each has more to tell of its own beautiful structure and associations than the space I intend to occupy will permit. As in the first series, my aim shall be rather to enlist your good-will to the study of these plants, than enter fully into scientific detail. This will be best accomplished by presenting specimens of the plants themselves, and pointing out some of their peculiarities, and the rich store of instructive entertainment they are calculated to afford,—convinced that where a love for them is excited, further inquiry will follow as a matter of course.

What an interest it adds to a rural walk, when we are able to distinguish, as so many friends, the various plants we meet with, and to call each of them by a name as familiar to us as their own lovely forms! The trees, the flowers, and even the little lichens and mosses, become thus more endeared, and

form a circle of sweet companions, whose cheerful looks greet us at every step, and, though silent, breathe into our hearts a spirit of gladness akin to that awakened by the innocent warblings of happy birds. Our walks are thus rendered more delightful; and, even in the most solitary paths, we are not lonely; for the varied and beauteous vegetable tribes, if we can understand their mute language, speak to us of the wisdom and goodness of Him who hath fashioned us all, and by his mighty power sustaineth us amid the vicissitudes of this world.

It is, therefore, not suprising that we should be anxious to extend this pleasant circle, as each new accession to it necessarily increases the amount of our happiness. The enthusiastic glow of delight which suffuses the heart, upon the discovery of a plant we had not known before, or even the acquisition of its name and place in the system of Nature for the first time, can only be conceived by those who have felt it, and its purifying and elevating influence estimated as it deserves.

It is customary for those who make botany one of their studies, to form a collection of dried specimens, which is called an *herbarium*. "It was a maxim of Linnæus, that an herbanium is a far better help to the student than the best of mere artificial representations, such as drawings and engravings of plants, and that it is a thing essential to every botanist. The use of such a collection is obvious: You have the plants themselves, the very original handiworks of Nature before your eyes, to consult and examine, and to compare with others whose species it may be wished to ascertain; they are always at hand, and ready to refer to, even at those seasons of the year, the dreary months of winter, when it is impossible to procure the living plants."

Independent of the usefulness of such a collection, it may be considered as a storehouse of beautiful objects, each associated with numerous sentiments and feelings. Upon every inspection of them, even in the depth of winter, when the

howling storm and the drifting snow precludes your stirring abroad, your daily walks and more lengthened excursions are entered upon afresh; and the beautiful scenery, the varied charms of the seasons, or the remembrance of loved friends, are all conjured up, as if by talismanic influence, on looking upon these mute mementos of hours that are fled.

> "Here Spring perpetual leads the laughing hours,
> And Winter wears a wreath of Summer flowers."

The mosses are much more easily preserved than flowers, as their colours are not so evanescent. Your first process is laying them out. For this purpose, procure a quantity of paper, the more spongy the better,* and in each sheet spread out as many specimens as it will hold, taking care that each specimen shall show as nearly as possible the characteristics and habit of the species. They are then to be pressed by means of a screw-press, or heavy weight, to flatten them. A few hours of a screw-press, or a night of a heavy stone or pile of books, is sufficient for this purpose, and they have then to be dried. This is accomplished by placing a few sheets of paper above and below each sheet of specimens, and subjecting them again to pressure, of which a much less degree than the first will suffice. They may be left thus for several days, and will then be quite dry and ready for mounting.

In mounting them, it will be a matter of taste what size or quality of paper you use, whether in loose sheets, to be kept in a portfolio, or in a bound volume, or whether you include one or more species on a page; but care must be taken to distribute the specimens over the pages in such a manner that an equality of thickness may be preserved in a fasciculus or volume. Thin glue, which is preferable to gum, is to be applied with a camel-hair pencil to one side of the specimen, and the specimen immediately transferred to its place on the page

* Bentall's botanical drying paper is among the best.

assigned it, and pressed down by the hand with a sheet of bloating-paper until every part is completely affixed. Put them again under pressure for a day or two, until the glue is dry, to prevent them from curling; and then write underneath the name, locality, and date of collecting each specimen, with any remarks or references that will add to their interest.

LESSON I.

CLASSIFICATION OF THE MOSSES.

Before introducing to your notice a fresh series of specimens of the mosses, it may be as well to direct your attention, briefly, to their classification. This is looked upon by many as a very dry matter, but nevertheless it is one of importance. Individual objects may inspire us with many pleasing thoughts and feelings, and awaken numerous agreeable associations, which constitute the poetry of Nature; but, apart from such consideration, the mind, from an inherent love of order, feels a desire of generalizing or arranging and classifying these objects in such a manner as will enable it to view them as a whole, and perceive at a glance the mutual bonds of brotherhood by which they are connected.

Without, therefore, disregarding the simple, though important and heart-improving teachings of individual natural objects, we must not overlook the fact, that system enables us, with much greater facility, to become acquainted with the exact position and relations of each, and to recognize more distinctly the links of that mighty chain which binds together all the forms of organized being.

The arrangement of the genera of British Mosses in *Hooker's British Flora*, is extremely simple, and the few leading facts upon which it is founded are easily committed to memory. The primary sections are established on the position of the seta or fruit-stalk, which is produced either from the *summits* of the stems and branches, or from their *sides;* and the secondary ones on the absence or presence of a peristome or fringe round the mouth of the capsule.

Before proceeding to the illustration of species, I will lay before you a concise synopsis of the genera, arranged according to this method.

Section I.—ACROCARPI.—Fruit-stalk terminal.

Sub-Sect. I.—Astomi. Mouth of the capsule naked. Lid adhering.

Genus Andræa. Capsule four-valved.

Phascum. Capsule entire. Veil dimidiate.

Archidium. Capsule entire. Veil globose.

Sub-Sect. II.—Gymnostomi. Mouth of the capsule naked. Lid deciduous.

Sphagnum. Capsule sessile, on a soft pedunculated receptacle. Veil irregularly torn.

Œdipodium. Capsule on a fleshy fruit-stalk, thickened upwards. Veil dimidiato-mitriform.

Gymnostomum. Capsule on a slender more or less elongated fruit-stalk. Veil dimidiate.

Anictangium. Capsule on a more or less elongated fruit-stalk. Veil mitriform.

Schistostega. Capsule on an elongated slender fruit-stalk. Lid thick. Veil campanulate.

Sub-Sect. III.—Peristomi. Mouth of the capsule fringed.

Division I.—Aploperistomi.—Fringe single.

Diphyscium. Fringe a cone-shaped plaited membrane. Capsule oblique.

Tetraphis. Fringe of 4 teeth.

Splachnum. Fringe of 8 or 16 teeth in pairs. Capsule with an evident apophysis.

Cyrtodon. Fringe of 16 equidistant entire teeth, marked with a central line, incurved when dry. Veil mitriform.

Conostomum. Fringe of 16 equidistant teeth, united at their summits. Veil dimidiate.

Encalypta. Fringe of 16 equidistant entire teeth. Veil campanulate.

Weissia. Fringe of 16 equidistant entire teeth. Veil dimidiate.

Grimmia. Fringe of 16 equidistant teeth, entire or perforated, rarely cleft. Veil mitriform.

Didymodon. Fringe of 16 or 32 teeth approaching in pairs, or united at the base. Veil dimidiate.

Trichostomum. Fringe of 16 equal teeth divided to the base, or 32 placed together in pairs. Veil mitriform.

Glyphomitrion. Fringe of 16 teeth approximated in pairs, reflexed when dry. Veil furrowed, covering the whole capsule.

Fissidens. Fringe of 16 broad bifid teeth. Seta lateral.

Dicranum. Fringe of 16 equidistant bifid teeth. Veil dimidiate.

Tortula. Fringe of 32 spirally-twisted teeth, united at the base. Veil dimidiate.

Cinclidotus. Fringe of 32 filiform, at length twisted teeth, anastomosing at the base. Veil mitriform.

Polytrichum. Fringe of 32 or 64 equidistant teeth, united at the extremity by a horizontal membrane. Veil hairy.

Division II.—Diploperistomi.—Fringe double.

Sub-Div. A.—*Inner fringe composed of distinct cilia.*

Entosthodon. Outer fringe of 16 remote teeth. Inner fringe obsolete or wanting.

Funaria. Outer fringe of 16 compact teeth. Inner of 16 cilia opposite to the teeth. Mouth of the capsule oblique.

Zygodon. Outer fringe of 16 teeth approaching in pairs. Inner of 8 or 16 horizontal cilia. Veil dimidiate.

Orthotrichum. Outer fringe of 16 teeth approaching in pairs. Inner of 8 or 16 horizontal cilia. Veil mitriform.

Orthodontium. Outer fringe of 16 erect teeth. Cilia of the inner fringe united at the base.

Sub-Div. B.—Inner fringe a laciniated membrane.

Bryum. Outer fringe of 16 teeth. Inner of 16 equal laciniæ, with filiform processes frequently placed between them.

Cinclidium. Outer fringe of 16 acute connivent teeth. Inner a perforated conical membrane.

Timmia. Outer fringe of 16 teeth. Inner a plaited membrane, cut into 32 equal cilia, variously united.

Bartramia. Outer fringe of 16 teeth. Inner of 16 equal bifid laciniæ.

Bartramidula.

Buxbaumia. Outer fringe of numerous filiform, erect, jointless teeth. Inner a plaited membranous cone. Capsule oblique.

Section II.—PLEUROCARPI.—Fruit-stalk lateral.

Sub-Sect. I.—Gymnostomi. Mouth of the capsule naked.

Hedwigia. Veil dimidiate.

Sub-Sect. II.—Peristomi. Mouth of the capsule fringed.

Division I.—Aploperistomi.—Fringe single.

Pterogonium. Fringe of 16 equidistant entire teeth. Veil dimidiate.

Leucodon. Fringe of 32 teeth closely united in pairs. Veil dimidiate.

Division II.—Diplóperistomi.—Fringe double.

Sub-Div. A.—Inner fringe composed of free cilia.

Neckera. Outer fringe of 16 teeth. Inner of 16 cilia, sometimes connected at the base by a short membrane. Veil dimidiate.

Anomodon. Outer fringe of 16 teeth. Inner of 16 cilia, arising from the side of the teeth. Veil dimidiate.

Daltonia. Outer fringe of 16 teeth. Inner of 16 cilia, arising from the side of the teeth. Veil mitriform.

Sub-Div. B.—Inner fringe composed of cilia, united below into a membrane, or connected by transverse bars.

Fontinalis. Outer fringe of 16 teeth. Inner of 16 cilia, connected by transverse bars. Veil mitriform.

Hookeria. Outer fringe of 16 teeth. Inner of 16 cilia, united below into a membrane. Veil mitriform.

Hypnum. Outer fringe of 16 teeth. Inner a membrane, cut into 16 equal segments, with filiform processes frequently placed between them. Veil dimidiate.

"How sweet to muse upon the skill displayed,
(Infinite skill!) in all that He has made!
To trace, in Nature's most minute design,
The signature and stamp of power divine."

LESSON II.

SPHAGNUM CYMBIFOLIUM.

BOAT-LEAVED BOG-MOSS.

Linnæus was inclined to consider all the forms comprised in the genus Sphagnum, as varieties of one species, *Sphagnum palustre.* Later continental writers have distinguished them as so many species,—Bridel enum erating16. Hooker, clinging more to the Linnæan idea, retains only 4 of these; but other British botanists, as Wilson and Walker-Arnott, who have very attentively studied this difficult family, are disposed

to multiply the species considerably, on what they deem good grounds, having, by patient microscopic investigation, detected characters which they think are constant.

The developement of these plants is greatly influenced by moisture, so that the same species varies in accordance with the nature of the locality in which it grows,—that vegetating on a merely moist heath would assume a very different aspect if placed in the nourishing waters of a deep marshy pool. The eye, however, can readily, in most cases, recognize the different forms, be they reckoned species or varieties, though a good microscope is requisite to make evident their distinctive characters.

The boat-leaved bog-moss (the *S. obtusifolium* of HOOKER'S BRITISH FLORA) has ovate concave leaves, resembling a boat in shape,—hence the name applied to it by Dillenius. It is found by the microscope that the *ramuli* or little branches have their exterior layer of cellules curiously lined with spiral filaments ; while, in its nearest ally, *S. compactum*, usually considered as a variety of it, these filaments, are wanting, although in both the leaves are minutely denticulated, which is not the case with the other species.

It is plentiful on wet moory ground and moist heaths, but attains its greatest perfection in marshes.

Although, to the eye of the careless observer, the Bog-mosses may seem of little consequence, they have an important agency in the operations of Nature,—their growth depending mainly on the absorption of moisture. Wherever there is an accumulation of this superfluous to man, these plants are ready to take it up, and convert it into soil, by their constant reproduction and decay,—thus transforming, in progress of time, the stagnant marsh into a fertile meadow.

"There's beauty all around our path, if but our watchful eyes
Will trace it in familiar things, and in their lowliest guise."

LESSON III.

SPHAGNUM FIMBRIATUM.

FIMBRIATED BOG-MOSS.

This has been ascertained to be the true *Sphagnum acutifolium* of EHRHART; but, as several other species are usually mixed up and confounded with it, Wilson has given it the above name, from the circumstance of its stem-leaves being destitute of membrane, so that their open ends present a fimbriated or fringed appearance.

It is of a more compact mode of growth than the other narrow-leaved species, and bears capsules less frequently. It is probably not uncommon, though often overlooked for the more generally diffused S. intermedium. On the Sidlaw

Hills, Forfarshire, both grow intermixed; but the Fimbriated bog-moss is readily distinguished, by never assuming the red tint so prevalent in the other.

In a marsh adjoining the beautiful lake of Rescobie, it grows associated with *S. cymbifolium, squarrosum, subsecundum,* and *cuspidatum,*—each, notwithstanding their close relationship, retaining that distinctness of outward appearance, or habit, which is so easily appreciable by the eye.

A lake has generally more to occupy the mind than mere scenic beauty, although this, it must be confessed, is always the ruling genius of such a place. Its margins, frequently wooded, or fringed with willows and wild roses, and the odoriferous Gale—the streams that enter it in search of repose after long journeys, or depart from it in quest of fresh adventures—and the marshy spots of such frequent occurrence in its vicinity—are usually the repositories of multitudes of curious plants, as well as of insects and shells; and where these abound, birds are not rare visitants.

A ramble by a lake is therefore well adapted to furnish an ample fund of entertainment; for, after you are tired gazing on its scenery, you have only to turn your attention to the places now indicated, and, whether botany or zoölogy be your favourite pursuit, you will find no lack of materials for the study of both.

"When the bright sunset fills
The silver woods with light, the green slope throws
Its shadow in the hollows of the hills,
And wide the upland glows.

And, when the eve is born,
In the blue lake, the sky, o'er-reaching far,
Is hollowed out, and the moon dips her horn,
And twinkles many a star.

Inverted in the tide,
Stand the grey rocks, and trembling shadows throw;
And the fair trees look over, side by side,
And see themselves below."

LESSON IV.

SPHAGNUM INTERMEDIUM.

INTERMEDIATE BOG-MOSS.

This species, usually confounded with S. acutifolium, is probably our most common Bog-moss, and occurs in dense rounded masses on the moist heaths and boggy parts of our hills and

mountains. The leaves are in form intermediate between those of the broad-leaved and narrow-leaved species, and the fruit is copiously produced.

What appears to be a seta or fruit-stalk in this genus of mosses, is not really such, but a pedunculated receptacle on which the capsule sits. When the seeds are ripe, the capsule becomes easily detached, so that, in collecting specimens for preservation, you must handle them gently, lest the fruit be all destroyed.

More or less of a red hue generally pervades the masses of this species,—contrasting strongly with the pale colour of its congeners. It furnishes an excellent habitation to some of the more interesting of our bog-plants, and not unfrequently do we find, on turning over one of the masses, that it is the abode of a colony of small brown ants. The beautiful Sun-dew, with its diamond-spangled leaves and small delicate white blossoms, that only open briefly to the meridian sun—the *Erica Tetralix*, with its drooping wax-like bells—the Bog Asphodel with its racemes of curious flowers—the elegant Butterfly Orchis—the Lesser Alpine Club-moss—and many others—are much indebted to the Bog-mosses for the shelter and nourishment they afford to their roots, so grateful in the heat of summer.

"Gems of every form and hue
Are glittering here in morning dew:
Jewels that all alike may share
As freely as the common air:
No niggard hand, no jealous eye,
Protects them from the passer by."

"In all places then, and in all seasons,
Flowers expand their light and soul-like wings,—
Teaching us, by sweet persuasive reasons,
How much akin they are to human things."

LESSON V.

SPHAGNUM CUSPIDATUM.

LONG-LEAVED SLENDER BOG-MOSS.

The leaves of this species are narrower and more elongated than those of the others, somewhat undulated, and slightly recurved. The branches are more attenuated, and the whole plant lax and tender; and, when growing in water, the stems are frequently several feet in length. The fruit is rare.

The leaves of the Bog-mosses are exceedingly beautiful objects under the microscope,—their reticulations being large, and the oblong transparent meshes curiously interrupted by delicate transverse lines.

A very good mode of mounting the leaves, capsules, &c., of mosses, as well as other minute subjects, for the microscope, is to lay them out between slips of thin glass, the sides and ends of which may be closed by stripes of gummed paper, so as to prevent them from shifting, or the ingress of dust. Talc or mica answers as well, but, from its brittleness, is more liable to injury.

Sets of specimens thus mounted might be kept in small boxes, and would often be useful, in conjunction with full-sized specimens mounted on paper, for reference and comparison.

The *Sphagna* cannot be confounded with any other British mosses, except, perhaps, the *Dicranum glaucum*, which has leaves somewhat resembling them in colour and texture. Its habit, too, and places of abode, are similar; and, as the fringed capsules are so seldom found, it might easily be mistaken, by one not acquainted with it, for a Sphagnum.

It grows in dense spreading patches of a glaucous green hue, whiter when dry, and rather rigid in appearance, though brittle. The leaves are lanceolate, upright, nerveless, and entire; and the brown ovate-fringed capsule, supported on a a short fruit-stalk, is slightly drooping.

To enable you to discriminate between this plant and the *Sphagna*, a specimen from the Sidlaw Hills is subjoined.

"Unlike the works of man, the works of God are always perfect, and most admirable when most examined. The finest cambrics, when seen through a magnifying power, will be discovered to have specks, and flaws, and uneven threads; but the smallest moss will be found full of symmetry and beauty."

"Wonderful, indeed, are all His works,
Pleasant to know, and worthiest to be all
Had in remembrance, always with delight."

DICRANUM GLAUCUM.

WHITE FORK-MOSS.

LESSON VI.

ANICTANGIUM CILIATUM.

HOARY-BRANCHED BEARDLESS-MOSS.

This plant grows upon stones, rocks, and walls, in broad flakes or patches, and is conspicuous from its hoary appearance, arising from its diaphanous-pointed leaves. These are concave, ovate, and accuminated into a slender colourless point, and those of the *perichætium*, or sheath around the base of the

seta, laciniated or jagged at the extremity. The capsule is almost sessile among the perichætial leaves, pear-shaped, with a wide naked mouth,—a plane lid having a small raised point in the centre, and a mitriform veil.

Many of the large stones or boulders we so often meet with in hilly places, are quite incased in this and similar spreading mosses; and the same verdant drapery is employed by Nature to adorn the rugged cliffs and the dilapidated wall,—thus rendering them more seemly and agreeable to the eye.

Rockwork in gardens might derive much advantage in their embellishment from an admixture of mosses with the alpine plants there usually cultivated; and, indeed, a moss-garden, as well as a Fernery, would add greatly to the interest of every flower-garden, and amply repay all the care bestowed upon them. The plants could thus be more easily watched throughout the whole progress of their development, and a fuller acquaintance be gained of their structure and history. A small bit of woodland, with a patch of moorland or heath, bordered by an old wall, having a rugged bank on the one side, and a stream on the other, would suffice for this purpose; or, where such a combination could not be commanded, nor even a shady nook or piece of rockwork, many of the species may be successfully cultivated in pots, or in a Wardian case,—the degree of moisture and shade being regulated by what you observe in their natural habitats.

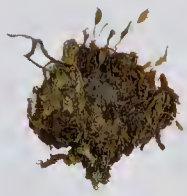
"What forests tall of tiniest moss
  Clothe every little stone!
What pigmy oaks their foliage toss
  O'er pigmy valleys lone!
With shade o'er shade, from ledge to ledge,
  Ambitious of the sky,
They feather o'er the steepest edge
  Of mountains mushroom high."

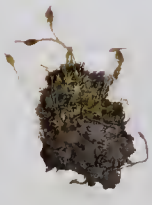
"With my cheek on one of those green stones,
That, fleeced with moss, beneath the shady trees
Lay round me, scattered like a flock of sheep,
I heard the music and the murmuring sound,
In that sweet mood when pleasure loves to pay
Tribute to ease, and, of its joy secure,
The heart luxuriates with indifferent things,
Wasting its kindliness on stocks and stones,
And on the vacant air."

LESSON VII.

WEISSIA CONTROVERSA.

GREEN-CUSHIONED WEISSIA.





This little moss is exceedingly abundant on almost every moist bank, and its frequent associate is the Mungo Park Moss, *Fissidens bryoides*. It grows like the latter in broad

patches, and the light green hue of its leaves, with the profusion of brown shining capsules, renders it more conspicuous than its size.

The stems are very short, and the narrow awl-shaped leaves curl up in drying. The capsule is between ovate and elliptical, with a rather long-beaked lid. The teeth of the fringe are broad and sometimes divided, so that it has been disputed to what genus it really belongs,—Smith and Turner having placed it in Grimmia. It has a close affinity with one of the beardless-mosses, *Gymnostomum microstomum*,—the latter agreeing with it in every respect, except in the absence of a fringe to the mouth of the capsule.

The hedge-bank is its favourite home ; and when you walk abroad in early summer, to breathe the perfume of the hawthorn's snowy blossoms, and the grateful fragrance of the sweet briar, you will be sure to meet with it nestling among primroses and violets. The birds will then be rearing their young, and you may frequently be startled by their hurried flight from the verdant branches around you ; but should you find their little nests, so carefully and delicately constructed, whether the eggs or young birds meet your view, gaze on them with admiration, but leave them uninjured. Although the sweet-songed creatures cannot express in language that you can understand the grief you might cause them by any act of wanton spoliation, yet they have their feelings ; and as the violation of these would not add to your happiness, it is better to leave the nests and birds as you find them, content with the pleasure their contemplation has afforded you.

" Some to the holly hedge
Nestling repair, and to the thicket some ;
Some to the rude protection of the thorn
Commit their feeble offspring ; the cleft tree
Offers its kind concealment to a few—
Their food its insects, and its moss their nests."

"Among the dwellings framed by birds,
In field or forest, with nice care,
Is none that with the little wren's
In snugness may compare.

No door the tenement requires,
And seldom needs a laboured roof;
Yet it is to the fiercest sun
Impervious, and storm-proof.

So warm, so beautiful withal,
In perfect fitness for its aim,
That to the kind by special grace
Their instinct surely came."

Mr Jennings makes the goldfinch say—

"I've a snug little nest
In a little elm tree:
This nest, I am sure,
You'll be pleased when you see.

It is made with much care,
And is lined so throughout;
It is neatness itself,
Both within and without:

But a dear little mate,
She with whom I am blest,
Is the neatest of all things
In this little nest.

Should you pass by in May,
When our little ones come,
Look in and you'll find
We've a snug little home.

No home like that home
Where two bosoms impart
Their finest of sympathies,
Warm from the heart:

Where Friendship, with Love,
Is perpetual guest;
And Affection's smooth pillow
A soft heaving breast."

The same ingenious author, in his *Ornithologia*, when treating of birds' nests, thus addresses a lady—

> "You, lady! when that smiling boy,
> Of promise bright, his parents' joy,
> Shall upward grow, will prompt his mind
> To all that's good and great—refined.
> O! teach him, when, you will know best,
> To love, admire the WARBLER'S NEST—
> Mark the DESIGN their nests among—
> Observe the wonders of their song,
> Their habits, their intelligence—
> And say not, *Man alone has sense*,
> But SEE THE STEPS OF PROVIDENCE."

LESSON VIII.

GRIMMIA PULVINATA.

GREY CUSHIONED GRIMMIA.

WITHERING says this is "the most common of all mosses," and upon nearly every old wall you are sure to meet with its soft rounded tufts that look like little pin-cushions.

The narrow elliptical leaves are somewhat abruptly accuminated into long white hairs, and the ovate channeled capsules, from the curvature of their setæ, seem reclining among the leaves. The lid is a lengthened cone, and the teeth of the fringe are generally more or less cleft or perforated.

An elongation of the leaf, or its nerve, without colouring matter, is a common circumstance among the mosses; but the purpose this serves in the vegetable economy is as little known to us as why a violet is purple or a primrose yellow. This ought to teach us humility. We have little cause to feel proud on account of knowledge; for every step we take in advance only tends to prove the extent of our ignorance. There is a mystery which pervades everything around us, that the human intellect, with its present limited powers, in vain attempts to pierce.

Let not such a view, however, deter us from inquiry; for the farther we advance in knowledge, the more is ignorance

vanquished; and although everything may not be revealed to us in this life, Hope points to a brighter era of our existence, when we shall no longer see "as through a glass darkly."

"While we see how unable we are to comprehend these His works, shall we wonder that some of the great mysteries of spiritual truth should be incomprehensible to finite minds; and, if a little moss on a rock can suffice to make us feel our ignorance, need we, on the sublime things of the kingdom of heaven, hesitate to say with Job—'Lo, these are parts of His ways; but how little a portion is heard of Him?'"

"Each stately tree that heavenward heaves
His green magnificence of leaves—
Each lonely bush that waves in air
Her verdure of entangled hair—
Each flower whose sweets impregns the gale—
Each blade of grass that greens the dale,
Now gemm'd with dewy jewels gay—
Their glancing glories round display."

"A blade of silver-hair-grass, nodding slowly
In the soft wind—the thistle's purple crown,
The ferns, the rushes tall, and *mosses lowly*—
A thorn, a weed, an insect, or a stone—
Can thrill me with sensations exquisite,
For all are exquisite; and every part
Points to the Mighty Hand that fashion'd it."

LESSON IX.

DIDYMODON PURPUREUS.

PURPLE DIDYMODON.

The Purple Didymodon is one of our most abundantly diffused mosses, and is not only found in the warmer parts of Europe, but extends to Iceland, and even to the more icy regions of Greenland. In Britain, its distribution is something like that of the daisy—wherever plants will grow you have a chance of meeting with it. It is found, from the sea-shore to the mountain summits, in the most exposed places, in the deepest shade, and in every variety of soil.

Its size and habit are as variable as its places of abode; but the capsules are more constant to their characters. The leaves are lanceolate, accuminated, and keeled, their margins recurved and entire. The capsule is between ovate and cylindrical, ob-

lique, furrowed when dry, with a conical lid; and a small *struma* or swelling at its base. The long narrow teeth of the fringe are sometimes connected by transverse bars. When ripe, the fruit and fruit-stalk are of a deep purple colour,—hence its name.

On any bit of waste ground, almost the first efforts of vegetation are the production of the Purple Didymodon, so that its office is in some respects similar to that of the lichen on the rock,—being the precursor of a more varied and luxuriant race of inhabitants.

Those humble plants that clothe the rock,
  Or green the sterile waste,
Of no importance seem to him
  Who scanneth things in haste;

But these the first foundations lay
  Of vegetative power,
And, but for these, we ne'er might have
  A green tree or a flower.

Then, while we view the wond'rous wealth
  The forest's shades disclose—
Or quaff the balm by meadows breathed,
  Or garden's blushing rose—

Or walk in the lone path where Spring
  Her primroses have strown—
Or thread the maze of Summer bower
  Which Flora claims her own—

May we, amid the gorgeous scene,
  Reflect from whence it sprung;
And ne'er, on humble things, contempt
  Of ours fall from the tongue;

For He whose wisdom plann'd the whole,
  Ordained that they should be;
And who the lowly moss dares spurn,
  Insults God's majesty.

LESSON X.

TORTULA MURALIS.

WALL SCREW-MOSS.

This is almost as common a moss on walls as the Cushioned Grimmia, and has much of its habit; but the form of its capsule and fringe will at once distinguish it. The teeth of the fringe in the genus Tortula, generally long, are spirally twisted, and united at the base.

The Wall Screw-moss is among the first of its tribe that appears upon stone walls, and is soon followed by many others. When Time has pronounced the wall "advanced in years," it has become quite a moss-garden, and an hour's examination will convince you that it gives a home to fifty or sixty different species, and often more.

A nearly allied species, the *Tortula ruralis*, is also frequent on walls, and on the roofs of thatched cottages, but is not confined to such places, being occasionally found on trees, and very abundantly on those sandy downs so prevalent on many parts of our coasts.

The peculiar fringe of the screw-mosses distinguishes them from all other native mosses, except the Fountain Lattice-moss,—*Cinclidotus fontinaloides*. This has a similar fringe of

32 slender teeth; but these only become twisted when the lid is removed, and at the base are not so closely united, merely inosculating; and the veil is mitriform. The lattice-moss is of a dark-green colour, and grows in long floating tufts on stones in running water.

When gathering the wall screw-moss, a curious tribe of plants, the stone-crops, will often attract your attention. They have thick succulent leaves, like those desert plants the *Cacti*, enabling them to accumulate and retain the juices they absorb, either from the scanty space their roots occupy, or the atmosphere around them. Their flowers are yellow, white, or pale rose-coloured. The yellow is most predominant, being that of the *Sedum acre*, whose spreading masses are the commonest and brightest ornaments of many an old wall and rock. It is called the Biting Stone-crop, or Pepper-wort, from the acrid nature of its juices.

"At the wall's base the fiery nettle springs,
With fruit globose and fierce with poisoned stings:
Above, the growth of many a year, is spread
The yellow level of the stonecrop's bed."

"Then from his rocky pulpit, I heard cry
The stonecrop—'See how loose to earth I grow,
And draw my juicy nurture from the sky.
So drive not thou, fond man, thy root too low;
But, loosely clinging here,
From God's supernal sphere
Draw life's unearthly food—catch
Heaven's undying glow.'"

LESSON XI.

ORTHOTRICHUM RUPINCOLA.

ROCK BRISTLE-MOSS.

The Rock Bristle-moss has an immersed capsule and double fringe, like the *Orthotrichum affine* given in the First Series of Lessons; but may at once be known from it by the darker green of the foliage, the deeper brown of the capsule, and the very hairy veil. The outer teeth of the fringe, sixteen in number, are erect, and the inner very fugacious.

The stems in the centre of the tufts are upright, but those of the circumference procumbent. It is plentiful on rocks and old walls, but, like *O. affine*, can flourish as well on the trunk of a tree.

Many beautiful species of the Bristle-mosses are found on the trunks and branches of trees, and some of them have associations endearing to every student of botany. The respected names of Ludwig, Lyell, Drummond, Hutchins, Roger, and Spruce, have been connected with them, in testimony of the value of their services in this branch of science; and every time we meet with the species bearing their respective names, we are reminded of something they have done to advance our knowledge. For instance, when in some lonely glen in the Highlands, we are picking from the silvered trunks of the

scattered birch trees the wide-spreading tufts of *Orthotrichum Drummondii*, we almost fancy Drummond by our side, opening up to us the wonders of the "far west;" and we are soon transported in imagination to the wild scenery of the Rocky Mountains, or the flower-enamelled prairies, from whence he culled so many of the gems that now adorn our gardens.

"These *botanists* trust
The lingering gleam of their departed lives
To *floral* record, and the silent heart;
Depositaries faithful and more kind
Than fondest epitaph; for if those fail,
What boots the sculptured tomb? And who can blame—
Who rather would not envy—men that feel
This mutual confidence; if, from such source,
The practice flow—if thence, or from a deep
And general humility in death?
Nor should I much condemn it, if it spring
From disregard of Time's destructive power,
As only capable to prey on things
Of earth, and human nature's mortal part."

LESSON XII.

BRYUM PALUSTRE.

MARSH THREAD-MOSS.

One of the most conspicuous mosses on wet moors and boggy places is the Marsh Thread-moss, known at a glance

from its bright yellow-green colour. Its stems are from three to six inches high, branched towards the summit. The leaves are lanceolate and obtuse, their surface *papillose*, or seemingly covered with small protuberances, caused by the convexity of the cells, and their margins entire and revolute.

The capsules are abundantly produced, usually in June, and are supported upon long setæ. They are oblique, ovate, *sulcated* or furrowed, and their lid conical. The inner fringe has its segments cleft, and a pair of cilia between each.

There are many attractions in the abode of a plant like this; and the season of its perfection, the "merry month of June," is in itself inviting to the lover of rural rambles. The soft airs whose gentle wings are scattering around the balmy essences of the summer flowers, and the cheerful many-toned voice of the woodlands, win the heart to Nature; and awakened enthusiasm delights to search out and contemplate her beauties, and from such pleasing contemplation waft the thoughts upwards to Him whose wonder-working hand hath called them into being.

We have already said that a marsh is "a perfect treasury to the naturalist;" but the bare enumeration of its botanical treasures would fill many pages. Besides those mentioned in association with the Squarrose Bog-Moss, a few others merit your particular attention. The little Marsh Violet, *Viola palustris*, with its pale-veined flowers, grows about its borders, in company with the Marsh Plume-thistle, *Carduus palustris*, the Marsh Penny-wort, *Hydrocotyle vulgaris*, the Butter-wort, *Pinguicula vulgaris*, the Red Rattle, *Pedicularis palustris*, the Grass of Parnassus, *Parnassia palustris*, and the Marsh Arrow-grass, *Triglochin palustre*,—all plants of curious structure, and worthy your careful examination. Farther into the watery places are the Purple Marsh Cinquefoil, *Comarum palustre*, the Water Plantain, *Alisma Plantago*, and the Cotton-grasses *Eriophorum;* and immersed in

the pools the singular Bladder-worts, *Utricularia.* These plants have floating stems with finely divided leaves, intermixed with little vesicles or bladders, which, before the time of flowering, are filled with water. When the blossoms are ready to expand, this water is exchanged for air, and the plant is enabled to rise to the surface; but, after flowering, the air is displaced by water, and the plant sinks again to ripen its seeds at the bottom.

LESSON XIII.

BRYUM CAPILLARE.

GREATER-MATTED THREAD-MOSS.

The leaves of the Capillary Thread-moss are obovate, with the nerve produced into a long hair-like point, and when dry they become twisted. The capules are oblong and pendulous, profusely covering the rounded spreading tufts.

It grows upon heaths, banks, and walls, but seems to have a preference for wet rocks, over which water occasionally trickles.

On some of the branches you will find the leaves broader, more highly coloured, and spread out like little stars. Among

these there are numerous oblong bodies, containing minute *gemmæ* or buds, which, when consigned to the earth, and fostered with the necessary degreee of heat and moisture, expand into plants similar to their parents. This mode of reproduction is common to many mosses, as well as other cryptogamic plants.

Its nearest ally is the Lesser Matted Thread-moss, one of the commonest mosses on walls and the roofs of cottages; but this may be readily distinguished by its narrower leaves, shorter nerves, and smaller more pyriform capsules.

The Matted Thread-mosses may not be generally regarded so beautiful as that group of the genus comprising the Thyme Thread-mosses; but we are very apt to judge erroneously of the merits of objects in this respect, by hasty comparison; and it would be less invidious, and more in accordance with reason, to endeavour to search out and appreciate latent beauty, than to lavish all our admiration on what is obvious to every eye.

When we see some lovely butterfly

> "Arrayed
> In crimson, azure, emerald, and gold,
> With more magnificence upon his wing—
> His little wing—than ever graced the robe
> Gorgeous of royalty"—

alighting upon a honied blossom as brilliant as itself, we are enraptured with the sight; but often turn aside unwisely from many of Nature's works that appear less attractive; whereas, were we to examine them attentively, we might discover innumerable beauties of which we never could have dreamed. To the glance of the casual observer, the Thyme Thread-moss given in next lesson, may appear a more elegant plant than the Matted Thread-moss of this; yet, place the leaves and capsules of both under the microscope, and you will find it difficult to say in which the elements of beauty most predominate.

LESSON XIV.

BRYUM LIGULATUM.

LONG-LEAVED THYME THREAD-MOSS.

Perhaps the most beautiful species of the genus Bryum is B. ligulatum, one of a group distinguished by the peculiarly-large and loosely-reticulated leaves.

The stems are usually several inches high, with numerous light green strap-shaped undulated leaves, that often spread out horizontally at the summit. The margins are thickened and

denticulate, and the nerve extends a little beyond the point. There are generally several fruit-stalks from the same point, bearing pendant ovate capsules, with conical lids, at first green, but changing to a rich tawny brown when mature.

It is frequent in woods and moist shady places; but a secluded rocky dell, with a stream in its bosom, well shaded by trees, seems its favourite home. Here, with some of its congeners, as *B. punctatum*, *hornum*, *affine*, and *rostratum*, it flourishes in great luxuriance, covering the rocks with a verdant mantle.

"Thy home is in the wild,
'Mong sylvan shades, near music-haunted springs,
Where peace dwells all apart from earthly things,
Like some secluded child.
The beauty of the sky—
The music of the woods—the love that stirs
Wherever Nature charms her worshippers—
Are all by thee brought nigh."

"Who forms thee thus, with unseen hand?
Who at creation gave command,
And will'd thee thus to be,
And keeps thee still in being, through
Age after age revolving?—Who
But the great God is He?
Yes: He who made and fosters thee,
In Reason's eye perforce must be
Of majesty divine.
Nor deems she that His guardian care
Will He in man's support forbear,
Who thus provides for thine."

"Dim world of weeping mosses!
A hundred years ago
Yon hoary-headed holly tree
Beheld thy streamlet flow:

See how he bends him down to hear
The tune that ceases never!
Old as the rocks, wild stream, he seems,
While thou art young for ever."

"Moist, bright, and green the landscape laughs around.
Full swell the woods; their every music wakes,
Mix'd in wild concert with the warbling brooks
Increased, the distant bleating of the hills,
And hollow lows responsive from the vales,
Whence, blending all, the sweeten'd zephyr springs."

LESSON XV.

BARTRAMIA ARCUATA.

CURVE-STALKED APPLE-MOSS.

It is singular that this beautiful moss, though not unfrequent in various parts of Britain, is wholly unknown on the Con-

tinent. On moist heaths, and on the rocky banks of streams in hilly places, it is met with commonly in dense masses; but its rich golden globular capsules are rare. These are supported on short curved setæ, that have frequently the appearance of being lateral, in consequence of the stems branching upwards proliferously: Hence our earlier writers considered it a Hypnum, and named it *H. chrysocomum.*

The ovate-lanceolate leaves are accuminated, serrated, and striated; and their bright yellow-green colour contrasts agreeably with the downy fuscous roots that so thickly clothe the lower parts of the stems.

The only time I ever gathered the fructification of this interesting moss, was in the spring of 1840, on one of the Sidlaw Hills, that which rises above the village of Auchterhouse.

> "It was an April morning: Fresh and clear
> The rivulet, delighting in its strength,
> Ran with a young man's speed; and yet the voice
> Of waters which the winter had supplied,
> Was soften'd down into a vernal tone."

The primroses thickly studded the banks with their profusion of fragrant blossoms, intermingled with strawberry-cinquefoil and blue violets; and in the shady crevices of rocks, and about old tree-roots,

> "With bright green mosses clad,"

were appearing the earliest delicate flowers of

> "The wood-sorrel, with its light green leaves
> Heart-shaped and triply folded, and its root
> Creeping like beaded coral."

On that beautiful morning, the fragrance and music of the heaths and woods was participated in by a beloved friend, now departed, and with him I shared the pleasure of picking the capsules of the Bartramia. To treasure up such memories in the heart, invests every specimen we gather with tenfold interest, and greatly enhances the pleasure we feel in their contemplation for many years after, perhaps for life.

There is a pleasure in linking the objects of Nature with our feelings and recollections, whether of persons, places, or events, which, though often sneered at by the thoughtless worldling, or the mere matter-of-fact philosopher, is so congenial to the finer sensibilities of the human mind, that few will care to forego the pleasure for fear of the censure.

A sprig of birch, for instance, culled in the vicinity of the Falls of Moness, has to many a greater charm about it than one gathered in any ordinary wood; for here, under these spreading birch-trees, did Burns compose his beautiful song, "The Birks of Aberfeldy;" and on looking at the sprig in after years, we feel ourselves standing with the poet amid the scenery he thus so graphically describes.

"The braes ascend, like lofty wa's,
The foaming stream deep-roaring fa's,
O'erhung wi' fragrant spreading shaws,
The birks of Aberfeldy.

The hoary cliffs are crown'd wi' flowers,
White o'er the linns the burnie pours,
And, rising, weets wi' misty showers
The birks of Aberfeldy."

"Lull'd in the countless chambers of the brain,
Our thoughts are link'd by many a hidden chain.
Awake but one, and, lo! what myriads rise!
Each stamps its image as the other flies!
Each, as the various avenues of sense
Delight or sorrow to the soul dispense,
Brightens or fades; yet all, with magic art,
Control the latent fibres of the heart."

Among my native hills, a gentle stream
Has oft been my companion. By its side,
In balmy summer, I have wander'd free
As the soft airs that, circling me about,

Have whisper'd of the homes of sweetest flowers,
And led me to them. Here communing with
These fragrant monitors, whose soothing voice
Instils celestial peace into the soul,
I oft have mark'd upon the jutting rocks
That skirt a pool, recipient of the stream,
After a playful leap, a shining moss,
Of golden hue, that won my admiration
By its rare beauty; and methought it bore
On its bright leaves, pure messages of Love
From the Great Source of Beautiful and Good.
Contentment seem'd its dowry, as it threw
Its golden mantle o'er the dripping rocks,
And drank the dews of heaven, and the soft spray
Of that small waterfall, and spread its leaves,
To catch the splendour of the morning sun.
Pleased with its humble lot, it lived and loved
All that was around it; and what more
Could He that gave it being, and with care
Tended and nourish'd it in that lone spot,
Do for its happiness? It wish'd no more!
Would man, thought I, but imitate the moss,
And thankfully enjoy what Heaven bestows,
How much of sorrow would he flee! What joy,
By calm contentment yielded, would he share,
To soothe Life's earthly pilgrimage!

LESSON XVI.

HYPNUM DENDROIDES.

TREE-LIKE FEATHER-MOSS.

One of the most interesting species of this extensive genus is the Tree Feather-moss, which bears a miniature resemblance to a tree,—the stem being almost naked below, with the branches collected into a fascicle or bundle at the top. The leaves are between ovate and lanceolate, serrated at the point, below which the nerve disappears. The capsules, which are not common, are ovato-cylindrical, upright, and numerous, with a nearly straight rostrate lid.

It is plentiful in moist woods and marshes, and on wet sandy places in the vicinity of the sea, such as the sands of Barrie on the coast of Forfarshire, where it covers large tracts of ground.

This is the *Leskea* dendroides of several authors. In Hypnum there are ciliary processes between the teeth of the inner fringe.

In Leskea these are wanting; but as this is the chief distinction between these two genera, and the habit of the species being similar, Hooker has deemed the difference too minute for general purposes to separate them.

What a multitude of pleasing images and thoughts can the Tree Feather-moss awaken in the mind! Even in the depth of winter, confined to our chamber by the war of the elements, when we look upon a specimen of this humble plant, we feel in a moment transported back to summer with all its glories, and trees rise around us in their wonted magnificence,—their rich verdure glistening in the warm sun-light, redolent of grateful odours and manifold harmonies.

The avenue of lindens, with its sweet murmur of bees—the daisied lawn, and its fine old sycamores, horse-chesnuts, and walnuts—the orchard,

> "One boundless blush, one white-empurpled shower
> Of mingled blossoms, where the raptured eye
> Hurries from joy to joy"—

the fragrant birch-woods of secluded Highland glens—and the lofty pine-forests that clothe the mountain sides,

> "Where the deer rustle through the twining brake,
> And the birds sing conceal'd"—

the gentle laburnum, shaking the dews of May from its golden tresses over the blossoming thorns—and the mighty oak, the proud monarch of the woodlands, whose giant form has battled triumphantly with the storms of ages—successively rise to our view, and crowd our minds with the pleasant memories of the past and glowing anticipations of the future.

> "Enchanting music breathes to please
> Me wheresoe'er I rove:
> The swinging trees, the humming bees,
> Speak harmony and love:
> The streamlet o'er its pebbly way
> Hums many a pleasant air;
> And countless birds, to glad my ear,
> Are singing everywhere."

LESSON XVII.

HYPNUM ALOPECURUM.

FOXTAIL FEATHER-MOSS.

This is the nearest ally to the Tree Feather-Moss, and differs in having the stem-leaves more spreading, and the fascicled branches at the top more branched, open, and droop-

ing. The capsules too are broader, and, like the branches, drooping, with the rostrate lid bent.

Its habitation is usually the rocky banks of streams, and not unfrequently is it found laved by their waters, when it becomes more branched and luxuriant.

In some moist secluded dell or wild ravine, where a sparkling brook toils its way over rocks and among flowery banks, soothing itself with its own gentle music, you will find an occasional walk full of interest. This may not always be accomplished without some difficulty; but imitate the brook, and, like it, the greater the obstacle, the greater will be your rejoicing in overcoming it. The mosses and other cryptogamic plants in such a place, will amply reward your exertions; and numerous flowers will here court your attention unknown to the meadows and open fields.

In early spring, you will find in such places the Tuberous Moschatell, *Adoxa moschatellina*, and the Golden Saxifrages, *Chrysosplenium oppositifolium*, and *alternifolium*; and in summer, when the "flaunting woodbine" fills the air with its lavish perfume, there may be met with, nestling among the copsewood, the Herb True Love, *Paris quadrifolia*, the Lily of the Valley, *Convallaria majalis*, the blue hyacinth, *Hyacinthus nonscriptus*, the wood Sanicle, *Sanicula Europæa*, the sweet Woodruffe, *Asperula odorata*, and many other lovers of the shade.

"Here do I love to be,—
Mine eye alone in passionate love to dwell
Upon the loveliness and purity
Of every bud and bell.

O, blessedness to lie
By the clear brook, where the long-bennet dips!
To press the rosebud in its purity
Unto the burning lips!

To lay the weary head
Upon the bank, with daisies all beset,
Or with bared feet, at early dawn, to tread
O'er mosses cool and wet."

LESSON XVIII.

HYPNUM PROLIFERUM.

PROLIFEROUS FEATHER-MOSS.

This moss is said to be almost universally diffused over the surface of our globe, and, like many other common things,

possesses greater elegance than those more highly esteemed on account of their rarity.

It is one of the finest ornaments of our woods, covering the earth as with a carpet of velvet, and often on the open heath

the verdure of its feathery stems receives additional brilliancy from the solar beam.

The stems are thrice pinnate, and the shoots repeatedly proliferous. The leaves are opaque, serrated, and papillose on the back. Those of the stem are cordato-accuminate and striated, with a nerve reaching nearly to the point, the branch leaves more ovate, and nerved only at the base. The brown ovate capsules are rare.

"The softly-warbled song
Comes from the pleasant woods, and colour'd wings
Glance quick in the bright sun, that moves along
The forest openings."

"Music awakes
The native voice of undissembled joy,
And thick around the woodland hymns arise."

"And now the wood engirds me,—the tall stems
Of birch and beech tree hemming me around,
Like pillars of some natural temple vast;
And here and there some giant pines ascend,
Briareus-like, amid the stirless air,
High stretching, like a good man's virtuous thoughts,
Forsaking earth for heaven."

"Look up!—aloft, the twittering birds are seen
Upon the branches, their wild matins singing:
Look down!—the grass is soft and thick, I ween;
And flowers around each old tree-root are springing,
Wood fancies, wild and sweet, to the lone wanderer bringing."

"The cottage-hearths are cold, the peasant sleeps,
But all the mighty woodlands are awake;
Within its hermitage the primrose keeps,
And with the dew the beech-trees' branches shake.
As through the wood my devious path I take,
The velvet moss a fairy carpet seems;
On which, through leafy curtains, light doth break,
Now bright and strong, and now in fitful gleams,
As 'mid realities come Fancy's fairest dreams."

LESSON XIX.

HYPNUM ADUNCUM.

CLAW-LEAVED FEATHER-MOSS.

This is one of the commonest mosses in bogs, and is very variable in size and colour. Its leaves are secund or turned to one side, very narrow, and much bent back, the nerve reaching

nearly to the point. The capsule is curved, oblong-ovate, and drooping, with a conical lid.

The form, named *H. revolvens* by Swartz, and Turner, has narrower leaves, which are *very* falcate, and usually of a deep red or purple colour, though sometimes paler, as in specimens growing plentifully on the Sands of Barrie. This is associated with *Hypnum lycopodioides*, which is a larger plant, with somewhat rugose or wrinkled and less falcate foliage, and always barren. It is the var. B. *rugosum* of Linnæus, and Hooker's British Flora. When old, or growing out of water, it generally assumes a yellow or tawny hue.

In those spots known as "well-ees" on the hills and mountains of Scotland, which are the sources of springs and streams, this moss is abundant, associated with the Scorpion Feather-moss, the Squarrose Fork-moss, the Fountain Apple-moss, and many others of a like nature.

"I seek the birth-place of a native stream."

"Let us trace this streamlet to its source:
Feebly it trickles with an earthy sound,
And a few steps may bring us to the spot
Where, haply, crown'd with flowerets and green herbs,
The mountain infant to the sun comes forth."

"To dignify the spot that gives thee birth,
No sign of hoar Antiquity's esteem
Appears, and none of modern Fortune's care;
Yet thou thyself hast round thee shed a gleam
Of brilliant moss, instinct with freshness rare,
Prompt offering to thy Foster-mother, Earth!"

"We 'll follow this winding path up to the hills,
And spring with a lightsome foot over the rills.
Up, up!—it grows sweeter the higher we get,
With the flowers of the season that linger here yet.
Nay, pause not to gaze at the landscape now;
It is finer when seen from the high hill's brow.
We will gather all curious flowers as we go—
The sweet, and the scentless, and those that bend low."

HYPNUM REVOLVENS.

SIDLAW HILLS, FORFARSHIRE, IN MARSHY PLACES.

This bright May morn, when smiling skies
  Invite us forth to roam,
Why should we shun the proffer'd bliss,
  And linger still at home?

The tuneful lark is calling us
  To breathe the fragrant air;
And bees, with joyful murmur say,
  That flowers are everywhere.

Now o'er the meadow, fresh and green,
  With daisies all bestrown,
We take our way, and pass the fence,
  With shining moss o'ergrown.

And now, within the joyous wood,
  Where happy birds are singing,
We wander free, and cull the flowers,
  So thick around us springing.

And now we seek the breezy hill,
  By some sweet streamlet led,
Whose sparkling waters lave the flowers
  That bloom around its bed:

And o'er the heath, with rosy Health,
  'Tis joy to hold our way;
And taste, with grateful hearts, the gift
  Of a bright morn in May.

And while, with curious eye, we mark
  The varied wonders round—
The warbling bird, the gilded fly,
  Or flowers that clothe the ground—

Or, lowlier still, the mossy tribes
  That tinge the rocks with green—
Or on the heath, or in the marsh,
  In beauteous crowds are seen—

We feel that Nature can to us
  Her own pure joy impart,
And touch, in sweetest symphony,
  The life-chords of our heart.

And oft with her communing thus,
  A higher joy is given:
"From Nature, up to Nature's God,"
  Our thoughts are wing'd to heaven.

HYPNUM REVOLVENS.

SANDS OF BARRIE, ON THE COAST OF FORFARSHIRE,
IN MARSHY GROUND.

"I loved to walk where none had walk'd before,
About the rocks that ran along the shore;
Or far beyond the sight of men to stray,
And take my pleasure when I lost my way:
For then 'twas mine to trace the hilly heath,
And all the mossy moor that lies beneath.
Here had I favourite stations, where I stood,
And heard the murmurs of the ocean flood,
With not a sound beside, except when flew
Aloft the lapwing, or the grey curlew;
Who, with wild notes, my fancied power defied,
And mock'd the dreams of solitary pride.
I loved to stop at every creek and bay,
Made by the river in its winding way;
And call to memory—not by marks they bare,
But by the thoughts that were created there."

HYPNUM LYCOPODIOIDES.

SANDS OF BARRIE, GROWING WITH THE LAST.

"How wondrous is the scene! where all is form'd
With number, weight, and measure!—all design'd
For some great end!—where not alone the plant
Of stately growth, the herb of glorious hue,
Or food-full substance—not the labouring steed,
The herd and flock that feed us—not the mine
That yields us stores for elegance and use—
The sea that loads our table, and conveys
The wanderer man from clime to clime—with all
Those rolling spheres that from on high shed down
Their kindly influence—not those alone,
Which strike e'en eyes incurious—but each moss,
Each shell, each crawling insect, holds a rank
Important in the plan of Him who framed
This scale of beings—holds a rank which lost
Would break the chain, and leave behind a gap
Which Nature's self would rue. Almighty Being!
Cause and support of all things! can I view
These objects of my wonder—can I feel
These fine sensations—and not think of Thee?"

LESSON XX.

HYPNUM COMMUTATUM.

CURLED FERN FEATHER-MOSS.

This beautiful species is peculiarly a lover of waterfalls, and its broad green masses often adorn the rocks within reach of

its spray. The stems are pinnated, and the leaves *falcato-secund*,—that is, sickle-shaped and turned to one side,—heart-shaped at the base, and much accuminated or narrowed towards the point, with the margins reflexed and serrated, and the nerve dissappearing below the summit. Like those of its congener the Lesser Golden Fern Feather-moss, *Hypnum filicinum*, the leaves become curled when dry, and vary in colour from the richest golden yellow to an intense green. The oblong capsule is curved and cernuous, with a conical lid, and when mature is of a deep tawny hue.

"The sound
Of a near fall of water every sense
Wakes from the charm of thought: Swift shrinking back,
I check my steps, and view the broken scene.
Smooth to the shelving brink a copious flood
Rolls fair and placid; where, collected all
In one impetuous torrent, down the steep
It thundering shoots, and shakes the country round.
At first an azure sheet, it rushes broad;
Then, whitening by degrees, as prone it falls,
And from the loud-resounding rocks below
Dash'd in a cloud of foam, it sends aloft
A hoary mist, and forms a ceaseless shower,
Nor can the tortured wave here find repose:
But, raging still amid the shaggy rocks,
Now flashes o'er the scatter'd fragments—now
Aslant the hollow'd channel rapid darts;
And falling fast from gradual slope to slope,
With wild infracted course, and lessen'd roar,
It gains a safer bed, and steals, at last,
Along the mazes of the quiet vale."

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